[0021] FIG. **12** is a cross section view of the sealing film architecture when the underlying key switch assembly is in a key button down position.

[0022] FIG. **13** is an oblique view of key sites tiled across a keyboard.

[0023] FIG. **14** illustrates a cross-section of a magnetic switching mechanism in an up position.

[0024] FIG. **15** illustrates an oblique view of an alternative embodiment movement assembly that employs wire formed springs.

[0025] FIG. **16** illustrates an oblique view of a sheet metal rubber dome assembly.

[0026] FIG. **17** illustrates a keypad where each key site employs a movement assembly in the form of metal springs for the spring function.

[0027] FIG. **18** is a top-down view of a key tiling pattern-dome placement between rows.

[0028] FIG. **19** illustrates a method of providing a key switch with a display area.

[0029] FIG. **20** illustrates a block diagram of a computing system operable to interface to a keyboard that employs the key switch assembly of the disclosed mechanical architecture.

DETAILED DESCRIPTION

[0030] The disclosed mechanical architecture provides maximum viewing area on the key button tops for the display keyboards, keypads, game controllers and the like, that operate in combination with an optical surface (e.g., a wedge lens), and with tactile feel similar to standard laptop keyboards. The mechanics can include a movement assembly such as a scissor key structure or a hollow key stem silo structure that defines an internal aperture through which an image can be projected onto the key button top for viewing. The architecture moves the tactile feedback mechanism (e.g., dome assembly) out from underneath the key button to the perimeter or side of the key switch assembly.

[0031] Reference is now made to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding thereof. It may be evident, however, that the novel embodiments can be practiced without these specific details. In other instances, well known structures and devices are shown in block diagram form in order to facilitate a description thereof. The intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the claimed subject matter.

[0032] FIG. **1** illustrates a key switch assembly **100** for display-type keys for user input devices. The switch assembly **100** includes, generally, a key button **102** (represented generally as a block) having a display portion **104** onto which light **106** is directed for viewing display information, such as letters, characters, images, video, other markings, etc. The display portion **104** can be a separate piece of translucent or transparent material embedded into the top of the key button **102** that allows the light imposed on the underlying surface of the display portion **104** to be perceived on the top surface of the display portion **104**.

[0033] The switch assembly **100** also includes a movement assembly **108** (represented generally as a block) in contact with the key button **102** for facilitating vertical movement of the key button **102**. The movement assembly **108** defines an aperture **110** through which the light **106** is projected onto the display portion **104**. Additionally, the structure of the key button **102** can also allow the aperture **110** to extend into the key button structure; however, this is not a requirement, since alternatively, the key button **102** can be a solid block of material into which the display portion **104** is embedded; the display portion extending the full height of the key button **102** from the top surface to the bottom surface.

[0034] A feedback assembly **112** of the switch assembly **100** can include an elastomeric (e.g., rubber, silicone, etc.) dome assembly **114** that is offset from a center axis **116** of the key button **102** and in contact with the movement assembly **108** for providing tactile feedback to the user. It is to be understood that multiple dome assemblies can be utilized with each key switch assembly **100**. The feedback assembly **112** may optionally include a feedback arm **118** that extends from the movement assembly **108** and compresses the dome assembly **114** on downward movement of the key button **102**.

[0035] The switch assembly **100** also includes contact arm **120** that enters close proximity with a surface **122** when the key button **102** is in the fully down mode. When in close proximity with the surface **122**, the contact arm **120** can be sensed, indicating that the key button **102** is in the fully down position. The contact arm **120** can be affixed to the key button **102** or the movement assembly **108** in a suitable manner that allows the fully down position to be sensed when in contact with or sufficiently proximate to the surface **122**.

[0036] The structure of switch assembly **100** allows the projection of an image through the switch assembly **100** onto the display portion **104**. It is therefore desirable to move as much hardware as possible away from the center axis **116** to provide the optimum aperture size for light transmission and image display. In support thereof, as shown, the feedback assembly **112** can be located between the keys and outside the general footprint defined by the key button **102** and movement assembly **108**. However, it is to be understood that other structural designs that place the feedback assembly closer to the footprint or in the periphery of the footprint fall within the scope of the disclosed architecture. Moreover, it is to be understood that the feedback assembly **112** can be placed partially or entirely in the aperture **110** provided there is suitable space remaining in the aperture **110** to allow the desired amount of light **106** to reach the display portion **104**.

[0037] FIG. **2** illustrates a side view of an exemplary scissor-type key switch assembly **200** in an up key position view **202** and a down key position view **204**. As shown in the up view **202**, the switch assembly **200** includes a key button **206**, a scissor-type movement assembly **208** in contact with (or affixed to) the key button **206**, and a feedback assembly **210** (for tactile feedback) that includes a dome assembly **212** and a feedback arm **214** that compresses the dome assembly **212** when the key button **206** is moving in a downward motion. The dome assembly **212** is under the key frame between the keys, rather than of under the center of the key as in conventional implementations. In one embodiment, the inside center stub of the dome can be used with a reflective sensing material to be sensed as the material contacts an optical display/detection surface **216**. Alternatively, a grid of traditional plastic sheets (e.g., polyester) can be utilized, but with cutouts for the key displays.

[0038] In the up view **202**, the dome assembly **212** is shown in the fully relaxed position. The switch assembly **200** is positioned over the optical display/detection surface **216** via which light is communicated and directed upward through